In the Claims:

1. (PREVIOUSLY PRESENTED) A system for processing an optical signal into a plurality of optical output signals comprising:

a laser for generating an optical signal along an optical signal path;

an optical splitter positioned along the optical signal path for receiving the optical signal, said optical splitter comprising

an input optical fiber that receives the optical signal;

a stepped, optical splitter circuit formed from a plurality of laser ion doped optical waveguides or fibers branching stepwise into a plurality of output optical fibers; and

an optical pump source for pumping an optical pump signal through the stepped, optical splitter circuit in the same direction as the optical signal entering the input optical fiber, exciting the laser ions in the stepped optical splitter circuit, and distributing gain throughout the optical splitter circuit.

2. (CANCELLED)

3. (ORIGINAL) The system according to Claim 1, wherein the optical signal received within the input optical fiber is about 1550 nm wavelength and the optical pump signal is one of about 980 or about 1480 nm.

4. (ORIGINAL) The system according to Claim 1, wherein the laser ions comprise erbium ions.

5. (ORIGINAL) The system according to Claim 1, wherein said stepped, optical splitter circuit comprises 2n optical fiber outputs, wherein n is the number of steps.

6. (CURRENTLY AMENDED) An optical splitter comprising:

an input optical fiber that receives an optical signal;

a stepped, optical splitter circuit connected to the input optical fiber and formed from a plurality of laser ion doped optical waveguides or fibers branching stepwise into a plurality of output optical fibers; and

an optical pump source for pumping an optical pump signal through the stepped, optical splitter circuit <u>in the same direction as the optical signal entering the input optical filter</u>, exciting the laser ions in the stepped optical splitter circuit and distributing gain throughout the optical splitter circuit.

7. (CANCELLED)

8. (ORIGINAL) An optical splitter according to Claim 6, wherein the optical fiber received within the input optical fiber is about 1550 nm wavelength and the optical pump signal is one of about 980 or about 1480 nm.

9. (ORIGINAL) An optical splitter according to Claim 6, wherein the laser ions comprise erbium ions.

10. (PREVIOUSLY PRESENTED) An optical splitter comprising:

an input optical fiber that receives an optical signal;

a stepped, optical splitter circuit connected to the input optical fiber and formed from a plurality of laser ion doped optical waveguides or fibers branching stepwise into Nm output optical fibers where m is the number of steps in the optical splitter circuit and N is the number of splitter branches; and

an optical pump source for pumping an optical pump signal through the optical splitter circuit in the same direction as the optical signal entering the input optical fiber, exciting the laser ions in the stepped optical splitter circuit, and distributing gain throughout the optical splitter circuit.

11. (CANCELLED)

12. (ORIGINAL) An optical splitter according to Claim 10, wherein the optical fiber received within the input optical fiber is about 1550 nm wavelength and the optical pump signal is one of about 980 or about 1480 nm.

13. (CANCELLED)

14. (PREVIOUSLY PRESENTED) A method of processing an optical signal into a plurality of optical output signals comprising the steps of:

generating an optical signal;

transmitting the optical signal along an optical fiber signal to a stepped optical splitter circuit formed from a

plurality of laser ion doped optical waveguides branching into a plurality of output optical fibers; and

optically splitting the optical signal stepwise at the optical splitter circuit into a plurality of output signals while simultaneously distributing gain during the stepwise splitting by pumping an optical pump signal within the stepped optical splitter circuit in the same direction as the optical signal passes stepwise through the optical splitter circuit.

15. (CANCELLED)

16. (CANCELLED)

17. (PREVIOUSLY PRESENTED) A method according to Claim 14, and further comprising the step of distributing gain by passing the optical signal through stepped erbium doped waveguides that receive the optical pump signal.

18. (ORIGINAL) A method according to Claim 17, and further comprising the step of pumping an optical pump signal through the stepped erbium doped waveguides at a wavelength for exciting erbium and amplifying the optical signal.

19. (ORIGINAL) A method according to Claim 18, and further comprising the step of generating the optical signal at about 1550 nm wavelength and pumping the optical pump signal at about one of 980 or about 1480 nm.

20. (CANCELLED)

21. (PREVIOUSLY PRESENTED) A method according to Claim 14, wherein the laser ions comprise erbium ions.

22. (PREVIOUSLY PRESENTED) A method of processing an optical signal into a plurality of optical output signals comprising the steps of:

generating an optical signal;

transmitting the optical signal along an optical fiber to a stepped optical splitter circuit formed from a plurality of laser ion doped optical waveguides or fibers branching into a plurality of output optical fibers; and

optically splitting the optical signal stepwise at the splitter into 2m output optical signals where m is the number of steps in the optical splitter while simultaneously distributing gain during stepwise splitting by pumping an optical signal within the stepped optical splitter in the same direction as the optical signal passes stepwise through the splitter.

23. (CURRENTLY AMENDED) A method according to ~~Claim 23,~~ Claim 22, and further comprising the step of distributing gain by passing the optical signal through stepped erbium doped waveguides that receive an optical pump signal.

24. (ORIGINAL) A method according to Claim 23, and further comprising the step of pumping an optical pump signal through the stepped erbium doped waveguides at a wavelength for exciting erbium and amplifying the optical signal.

25. (ORIGINAL) A method according to Claim 24, and further comprising the step of generating the optical signal at about 1550 nm wavelength and pumping the optical pump signal at about one of 980 or about 1480 nm.

26. (CANCELLED)